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WAR DEPARTMENT TECHNICAL MANUAL

U.S. Dept of Army



GASOLINE STOVES AND BURNERS

WAR DEPARTMENT • MAY 1945

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WAR DEPARTMENT TECHNICAL MANUAL
TM 8-615

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GASOLINE STOVES
AND BURNERS



WAR DEPARTMENT • MAY 1945

WAR DEPARTMENT

Washington 25, D. C., 25 May 1945

TM 8-615, Gasoline Stoves and Burners, is published for the information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

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PART ONE

INTRODUCTION

Section I. GENERAL

1. Scope

These instructions are published for the information and guidance of the personnel to whom this equipment is assigned. They contain information on the operation and maintenance of the equipment as well as descriptions of the major units and their functions in relation to the other components of the equipment. They apply only to the following Medical Department Items:

Medical Dept. No.	Nomenclature	Figure No.
9955000	Stove, 1-burner, gasoline:	1
9955500	Stove, 2-burner, gasoline:	2
9R10000	Burner, one 5,000 B.T.U. head, gasoline:	3
9R10001	Burner, one 10,000 B.T.U. head, gasoline:	4
9R10002	Burner, two 10,000 B.T.U. heads, gasoline:	5
9R10003	Burner, three 10,000 B.T.U. heads, gasoline:	6
9R10004	Burner, four 10,000 B.T.U. heads, gasoline:	7
9R10005	Burner, one 2,500 B.T.U. head, gasoline:	8
9R10006	Burner, three 10,000 B.T.U. heads, cylindrical, gasoline:	9

2. Records

No special maintenance forms are required to be kept by the using personnel except as may be prescribed by the medical officer in charge.

Section II. DESCRIPTION AND DATA

3. Description

a. The gasoline stoves and burners described in this manual are used as sources of heat in various pieces of Medical Department equipment, including several sterilizers, autoclaves, incubators and a distilling apparatus. In principle of operation, all the stoves and burners are identi-

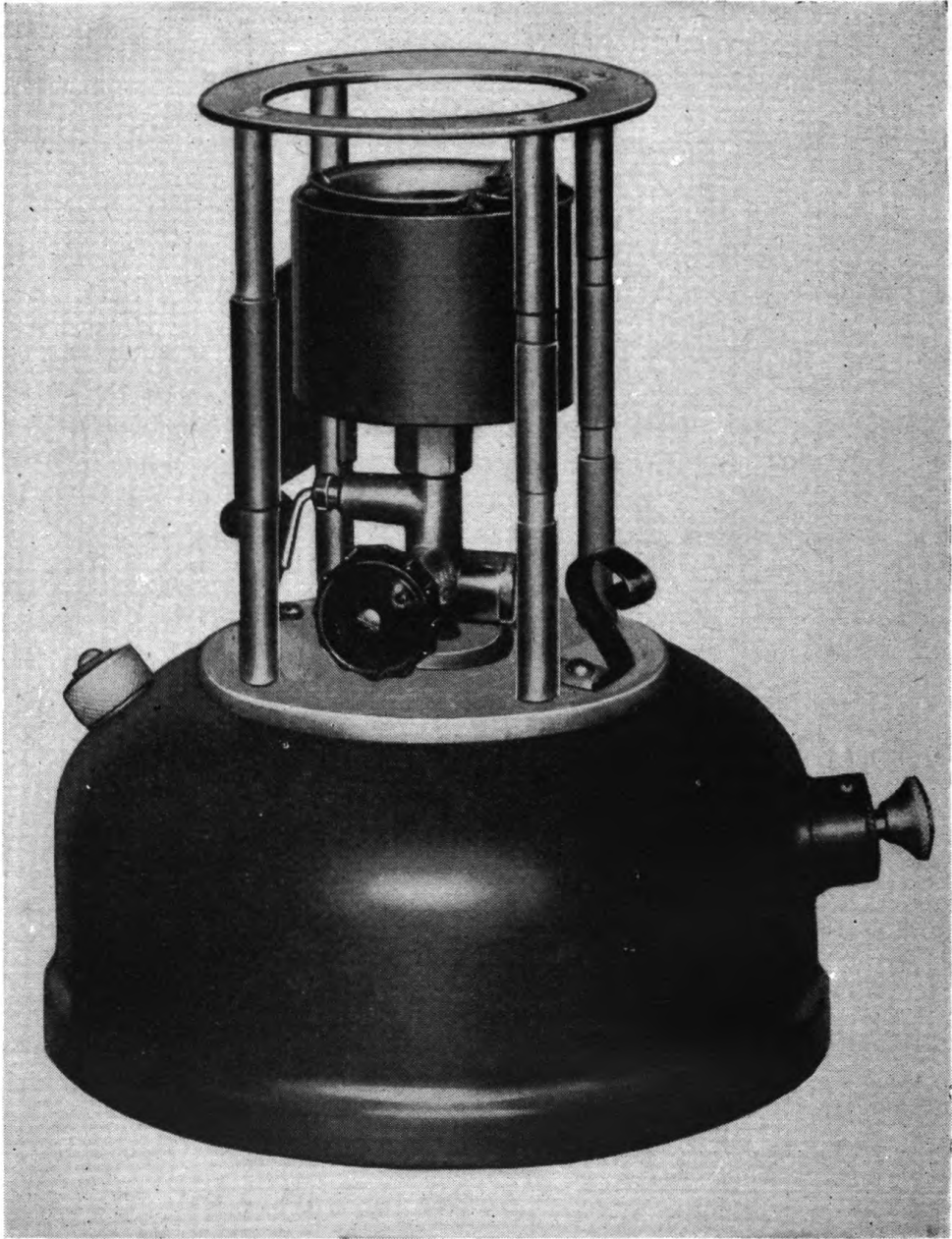


Figure 1. Item No. 9955000—Stove, 1 burner, gasoline.

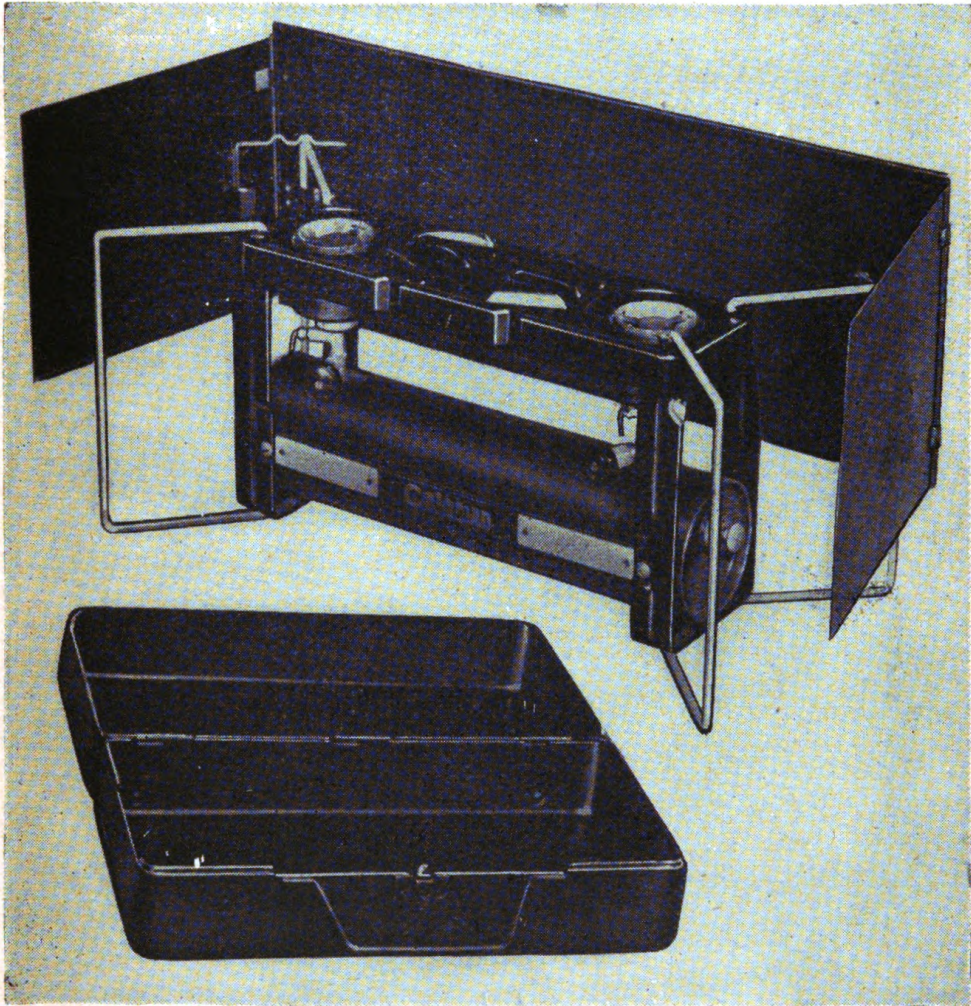


Figure 2. Item No. 9955500—Stove, 2 burner, gasoline.



Figure 3. Item No. 9R10000—Burner, one 5,000 B.T.U. head, gasoline.



Figure 4. Item No. 9R10001-Burner, one 1,000 B.T.U. head, gasoline.

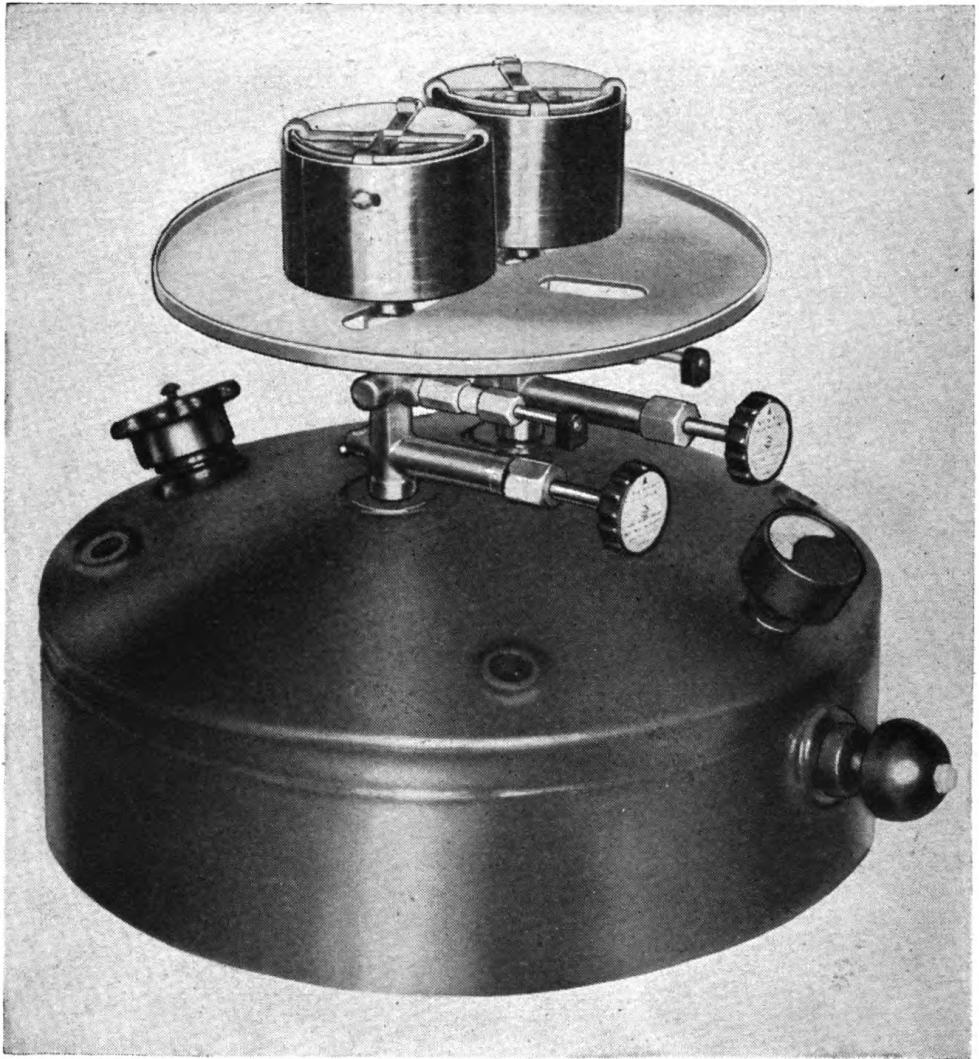


Figure 5. Item No. 9R10002-Burner, two 10,000 B.T.U. heads, gasoline.

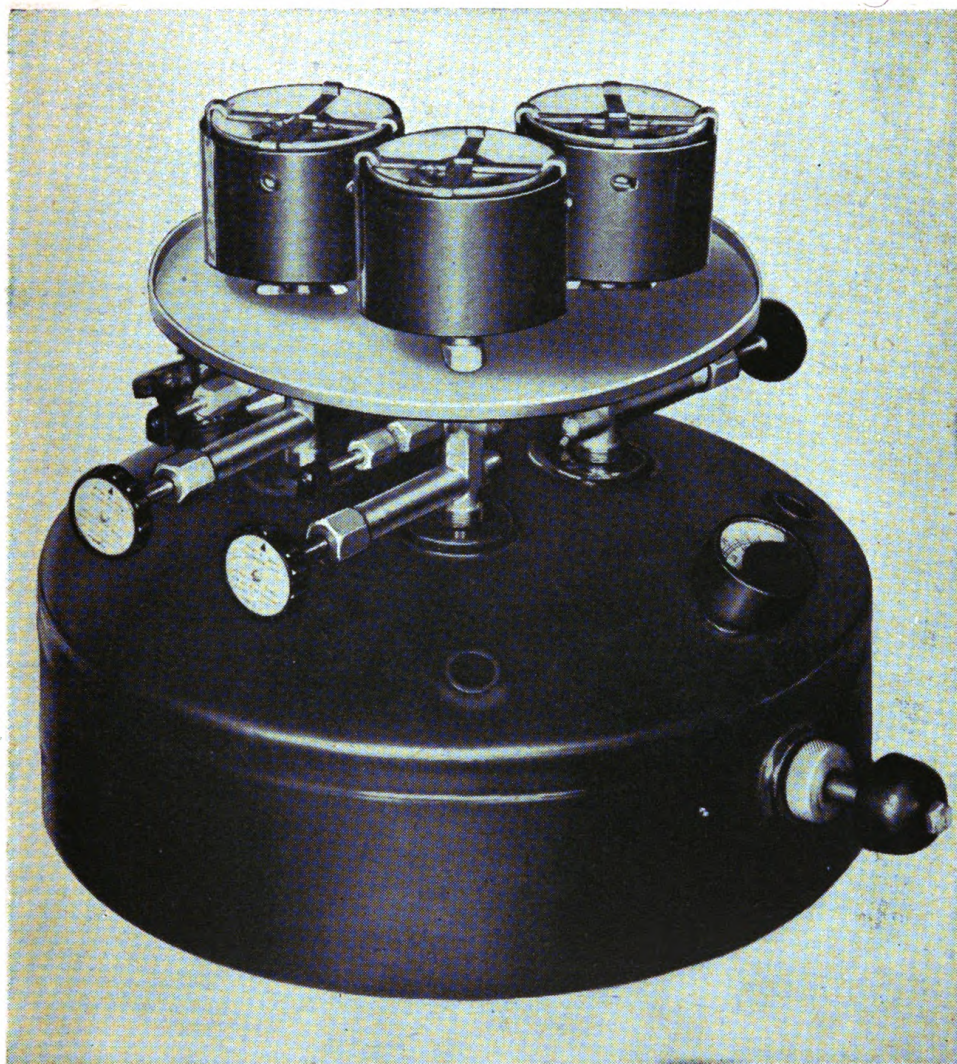


Figure 6. Item No. 9R10003-Burner, three 10,000 B.T.U. heads, gasoline.

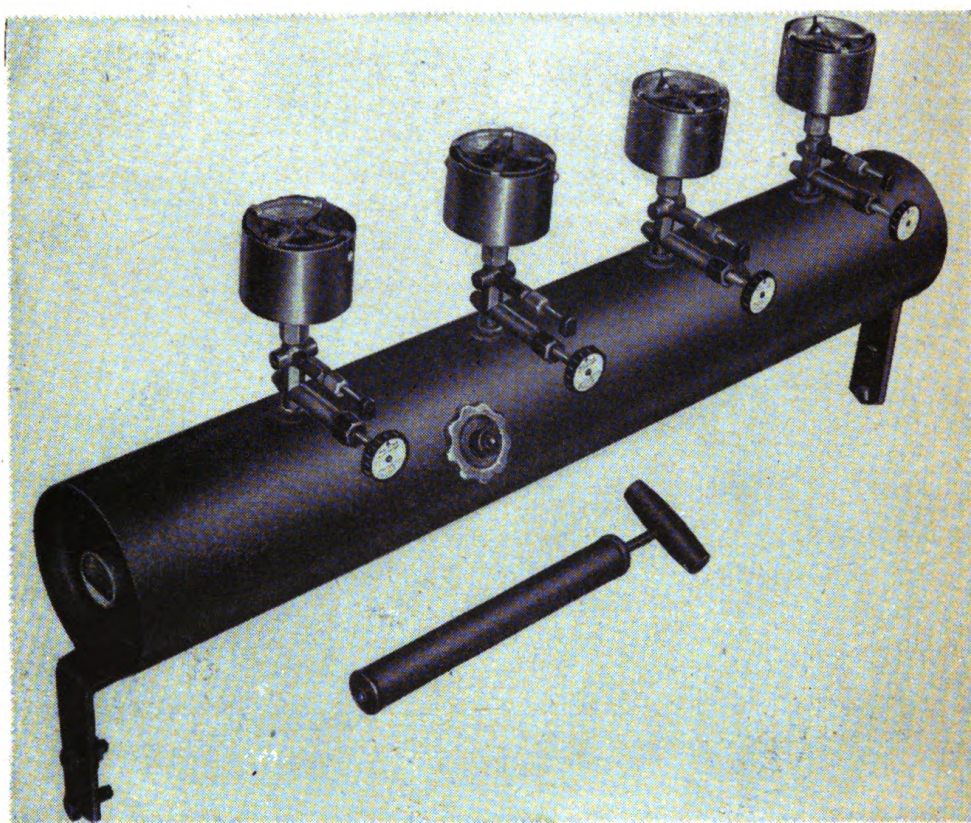


Figure 7. Item No. 9R10004—Burner, four 10,000 B.T.U. heads, gasoline.

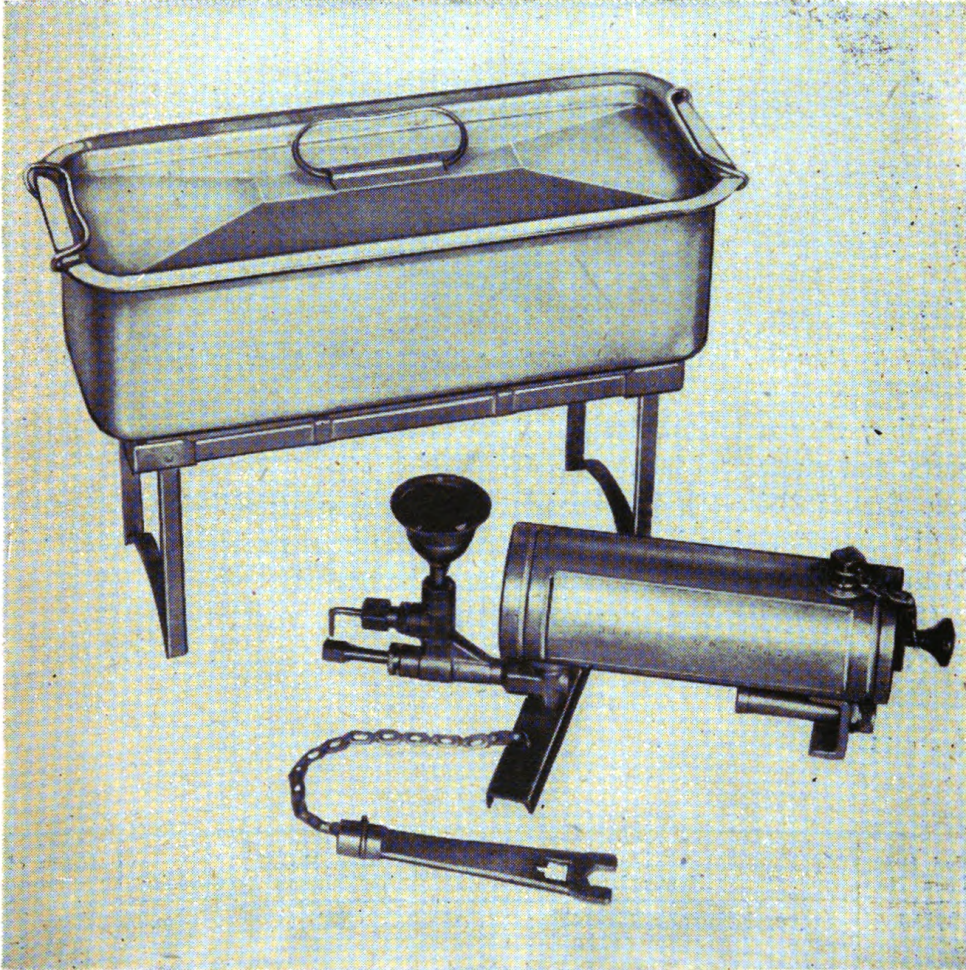


Figure 8. Item No. 9R10005-Burner, one 2,500 B.T.U. head, gasoline.

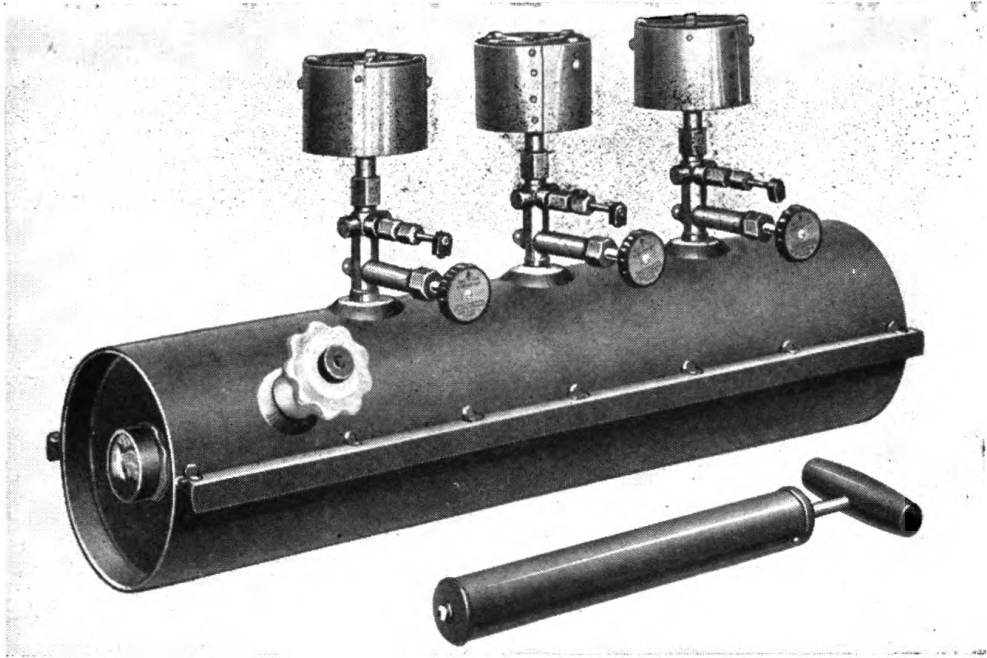


Figure 9. Item No. 9R10006—Burner, three 10,000 B.T.U. heads, cylindrical, gasoline.

cal; they vary as to capacity and shape of fuel tank, dimensions of certain parts, and number of burner heads.

b. Stoves differ from burners in that stoves are supplied with—

(1) A supporting frame above the burner head or heads (figs. 1 and 2) to hold vessels and other equipment to be heated.

(2) A carrying case or cover. (See fig. 2.)

4. Data

See table I.

Table I

Med. Dept. Item No.	Nomenclature	Mfg. No. for burners	Capacity	Hours of service
9955000	Stove, 1-Burner, Gasoline:	521	2 Pts.	5 to 7
9955500	Stove, 2-Burner, Gasoline:	523	2 Pts.	3 to 5
9R10000	Burner, one 5,000 B.T.U. head, gasoline:	526	2 Pts.	5 to 7
9R10001	Burner, one 10,000 B.T.U. head, gasoline:	522	2 Qts.	5 to 7
9R10002	Burner, two 10,000 B.T.U. heads, gasoline:	525	1 Gal.	5 to 7
9R10003	Burner, three 10,000 B.T.U. heads, gasoline:	524-497	1 Gal.	3 to 5
9R10004	Burner, four 10,000 B.T.U. heads, gasoline:	*522-375S	1 Gal.	2 to 4
9R10005	Burner, one 2,500 B.T.U. head, gasoline:	527	$\frac{3}{4}$ Pt.	2 to 3
9R10006	Burner, three 10,000 B.T.U. heads, cylindrical, gasoline:	*522-375S-3	3 Qts.	3 to 5

*Fuel tank manufactured by American Sterilizer Company.

5. Manufacturer

With the exception of the pump and fuel tank only of Item Nos. 9R10004, Burner, four 10,000 B.T.U. heads, gasoline (fig. 7), and 9R10006 Burner, three 10,000 B.T.U. heads, cylindrical, gasoline (fig. 9), all the stoves and burners described in this manual are manufactured in their entirety by the Coleman Lamp and Stove Company, Wichita, Kansas. The pump and fuel tank of Item Nos. 9R10004 and 9R10006 are manufactured by the supplier of the Medical Department items with which the items are used (Item No. 9950000, Sterilizer, dressing and utensil, horizontal: uses burner 9R10004 and Item No. 9950300, Sterilizer, dressing and utensil, for truck, surgical, operating: uses burner 9R10006).

Section III. TOOLS AND PARTS

6. Spare Parts Kits

Kits of spare parts which include a wrench are available for each stove and burner, except for burner 9R10006 which uses the same kit as for burner 9R10004. Each kit is marked with the manufacturer's number of the stove or burner with which the kit is to be used. The kits are listed in the appendix by Medical Department number of the kit, Medical Department item number and manufacturer's number of the stove or burner with which the kit is to be used, and the parts in the kit by Medical Department number, description, and quantity in the kit.

PART TWO

OPERATING INSTRUCTIONS

Section IV. GENERAL

7. Scope

Part Two contains information for the guidance of the personnel responsible for the operation of this equipment. It contains information on the operation of the equipment with the description and location of the controls and instruments.

Note. Failure or unsatisfactory performance of equipment will be reported on WD, AGO Form 468.

Section V. SERVICE UPON RECEIPT OF EQUIPMENT

8. Unpacking and Assembling

The stoves and burners, as issued, are completely assembled and ready for operation. Instructions for unpacking and assembling are therefore unnecessary.

Section VI. CONTROLS AND INSTRUMENTS

9. Controls

a. FUEL CONTROL VALVE. A fuel control valve, usually located directly below the eccentric lever, controls the amount of fuel to the burner head.

b. ECCENTRIC LEVER. An eccentric lever is located above the fuel control valve and below the burner head. It serves to clean the gas orifice and adjust the size of the flame.

10. Instruments

a. AIR PRESSURE GAUGE. An air pressure gauge (fig. 10 (21)) is supplied with some of the burners and is located on the gasoline storage tank.

b. FUEL GAUGE. Some models have a fuel gauge attached to the fuel tank which indicates the level of the fuel in the tank.

<i>Med. Dept.</i> <i>No.</i>	<i>Nomenclature</i>	<i>Med. Dept.</i> <i>No.</i>	<i>Nomenclature</i>
1. 9R10084	GASKET, PLUG, BURNER ONE 10,000 B.T.U. HEAD:	19. 9R10200	STEM, VALVES, BURNERS 9R10001-2-3-4, COMPLETE:
2.	Filler plug disc.	20. 9R10136	PACKING, STEM, BURNERS, 9R10001-2-3-4:
3.	Filler plug cap.	21. 9R10088	GAGE, PRESSURE, BURNERS 9R10001-2-3:
4.	Valve housing.	22.	Fuel control rod.
5.	Eccentric block.	23.	Plunger cap.
6.	Jamb nut.	24.	Plunger handle.
7. 9R10112	NEEDLE ROD, VAPORIZER, BURNERS 9R10001-2-3-4:	25. 9R10158	PLUNGER, AIR-PUMP, BURNER ONE 10,000 B.T.U. HEAD:
8. 9R10184	SCREEN FILLER, BURNERS 9R10001-2-3-4:	26.	Fuel tank.
9.	Vaporizer tube.	27.	Tube coupling.
10. 9R10020	BAFFLE, WIND, BURNERS 9R10001-2-3-4:	28. 9R10228	TUBE, FUEL AND AIR, BURNERS 9R10001-2-3-4:
12. 9R10094	HEAD, BURNERS 9R10001-2-3-4:	29. 9R10012	AIR STEM, BURNER ONE 10,000 B.T.U. HEAD:
13.	Stem coupling.	30.	Plunger spring.
14.	Pack nut.	31. 9R10164	PLUNGER LEATHER, BURNERS 9R10001-2-3:
15.	Eccentric stem.	32.	Plunger nut.
16.	Stem handle.	33.	Check valve.
17.	Valve stem bushing.	34.	Filler tube.
18.	Pack nut.		

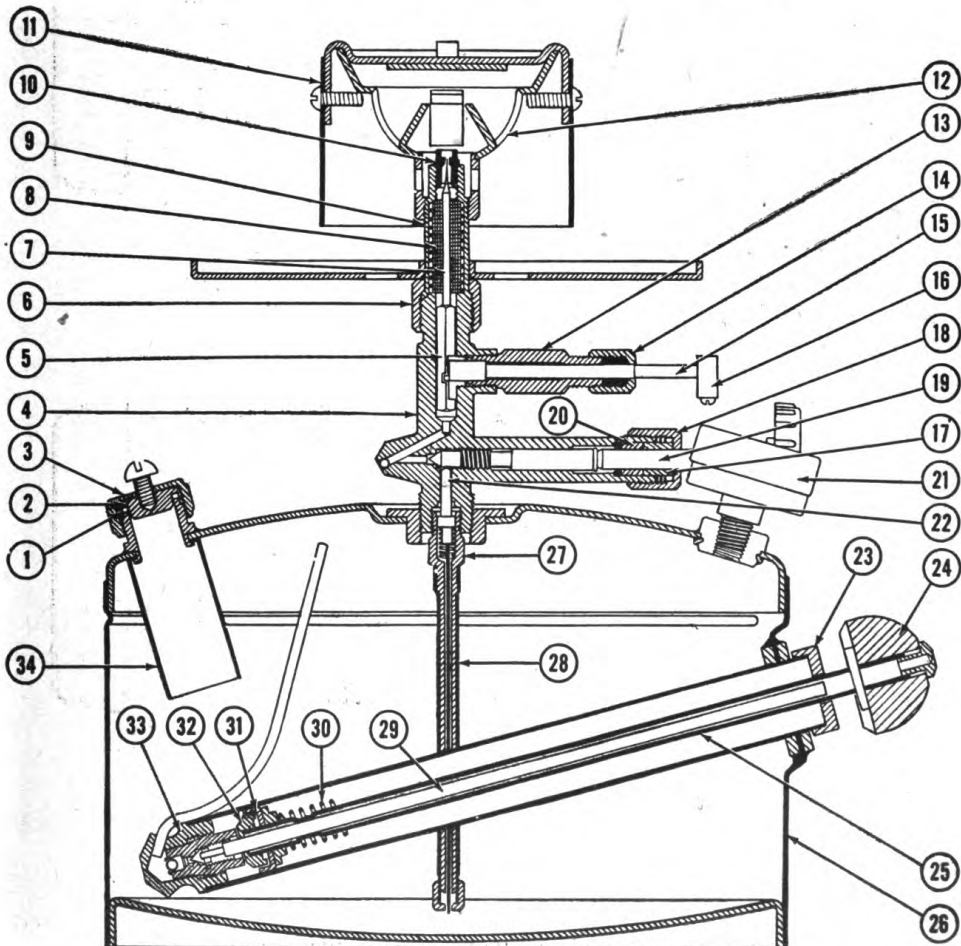


Figure 10. Cross section of burner, one 10,000 B.T.U. head. Item No. 9R10001.

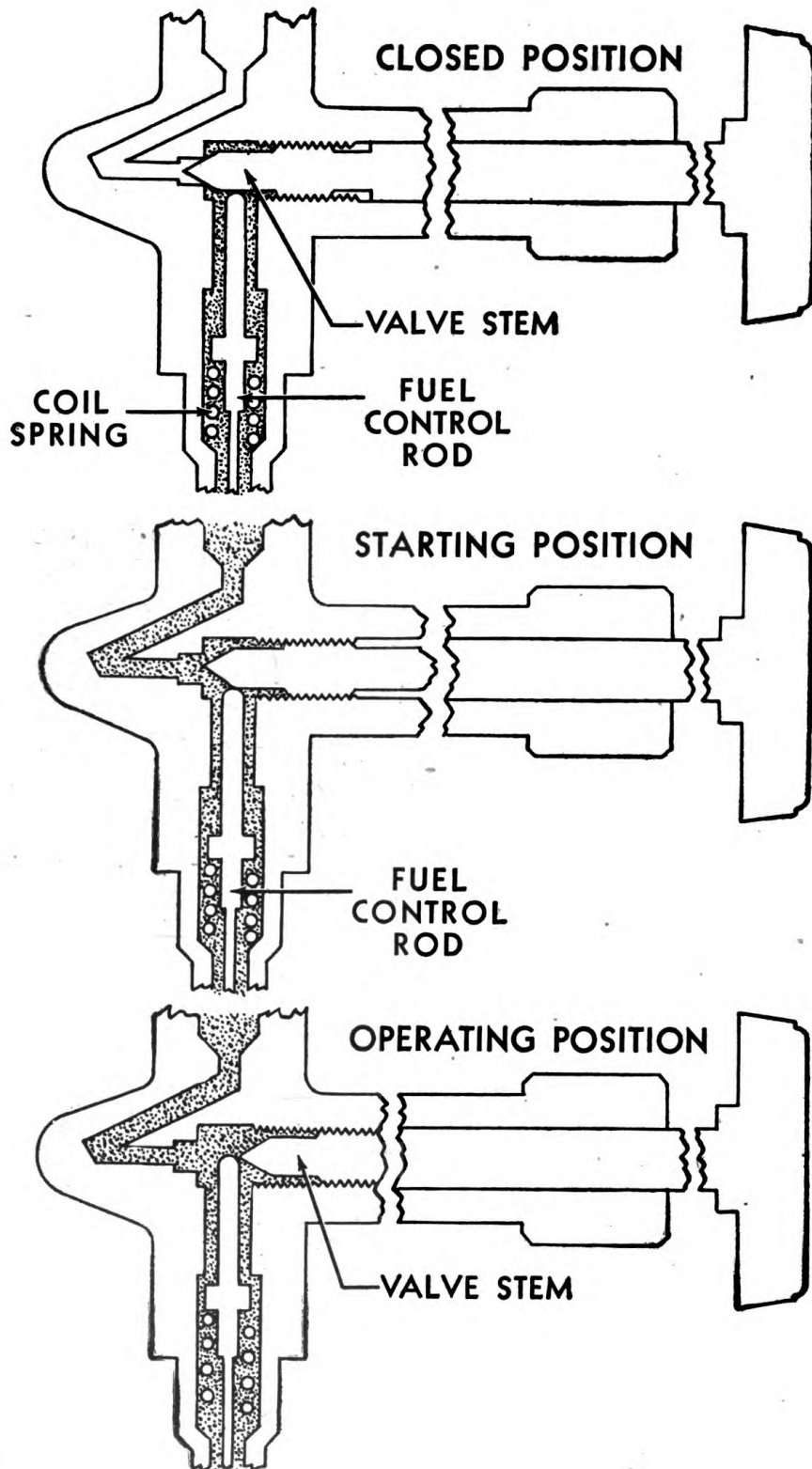


Figure 11. Cross section of fuel control valve.

Section VII. PRINCIPLE OF OPERATION

II. How Stove or Burner Operates

a. STARTING POSITION (figs. 11 and 12①).

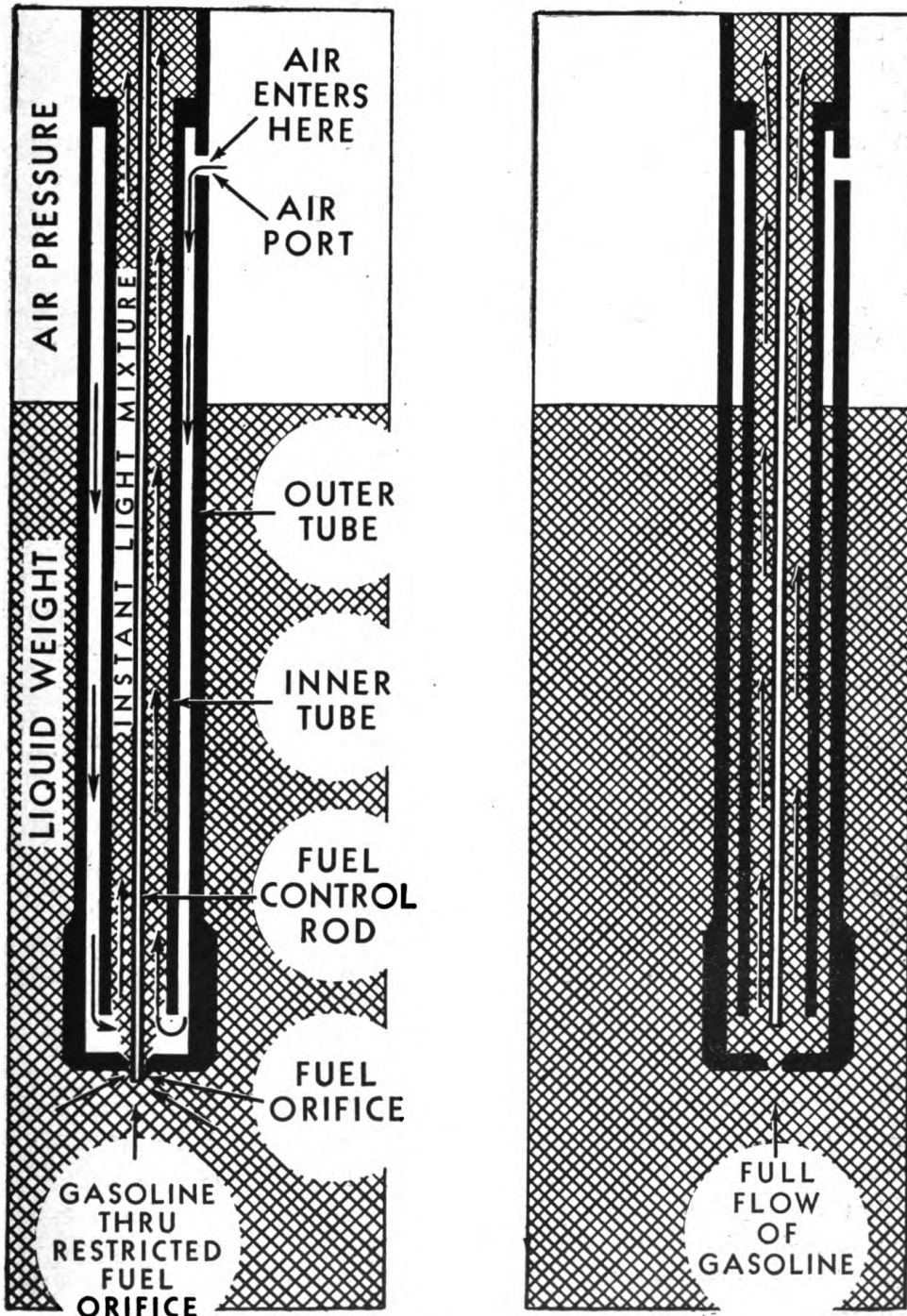


Figure 12. Cross section of fuel and air tube.

When the fuel control valve is opened a quarter turn, the fuel orifice is restricted by the fuel control rod but it is not completely closed. Opening the fuel control valve a quarter turn permits the air in the tank to enter the air port which is above the fuel level. The air travels down between the outer and inner tubes of the fuel and air tube. A restricted amount of fuel enters the fuel orifice and is forced up by the air pressure at the bottom of the outer tube. The air and fuel form an atomized instant light mixture which rises in the inner tube. Since air is withdrawn from the tank above the liquid fuel to form the instant light mixture, the air pressure will drop faster during this period than during subsequent normal operation when the fuel control valve is open as far as possible.

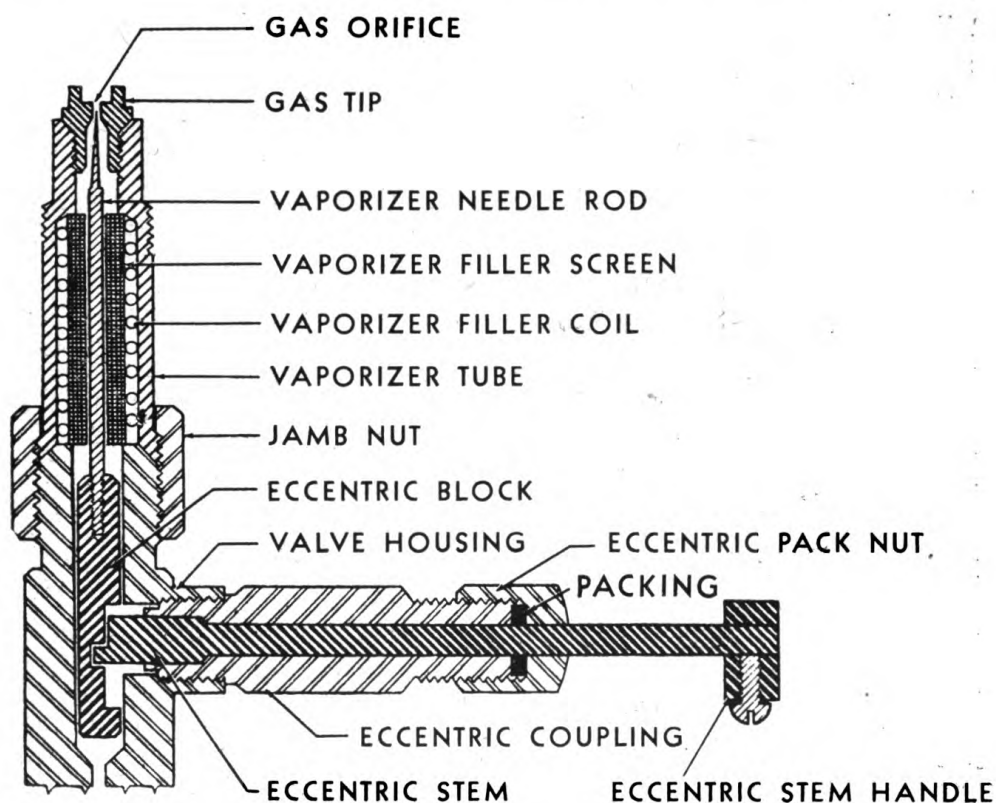


Figure 13. Cross section of vaporizer and eccentric.

b. OPERATING POSITION (figs. 11 and 12②). After the stove or burner has reached complete generation, which is usually within the first 5 or 6 minutes, the fuel control valve may be opened as far as possible. This withdraws the fuel control rod from the fuel orifice and allows a full flow of fuel. Since the size of the fuel orifice is greater than that of the gas orifice in the vaporizer (fig. 13), the fuel is forced into the space between the outer and inner tubes. This stops the flow of air from above the liquid fuel in the tank through the air port, and causes the fuel to be fed directly to the vaporizer.

12. Function of Vaporizer

The function of the vaporizer is to partly vaporize the fuel, by heat conducted from the burner head when the stove or burner is in operation. After leaving the vaporizer the partly vaporized stream of fuel strikes the burner plate (fig. 14) and mixes with the air drawn through the air

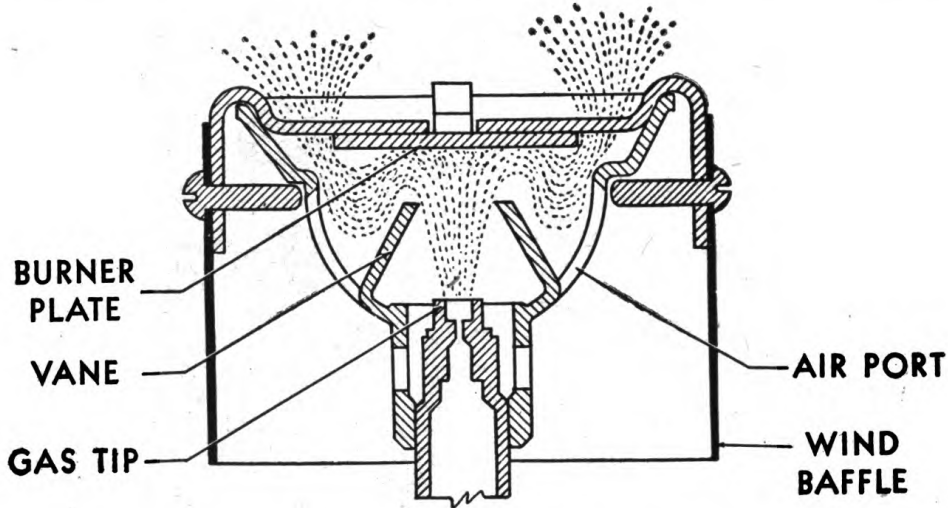


Figure 14. Cross section of head of burner.

ports of the burner head and past the vanes, to form a completely vaporized fuel that can be lighted at the top of the stove or burner.

Section VIII. OPERATING INSTRUCTIONS

13. Similarity of Operation

a. All the stoves and burners covered in this manual operate on the same principle.

b. The construction of the 2,500 B.T.U. burner, 9R10005 is slightly different since it is smaller than the other stoves and burners. It is part of the stove assembly, Item No. 9R10350. (See fig. 15.)

c. The burner heads of those models equipped with multiple heads may be operated independently or all at once: For example, Burner 9R10004 (fig. 7), with four burner heads, may be used with either one, two, three, or four burner heads in operation.

d. The fuel control valve (fig. 16 (1)) of burner 9R10005 has an extension which acts in the same capacity as the fuel control rod of the larger stoves and burners. This extension projects into the instant light body, and movement of the fuel control valve stem actuates both the fuel control valve and the instant light body valve. (See fig. 16 (18).) The principle involved in the operation of generating the instant light mixture

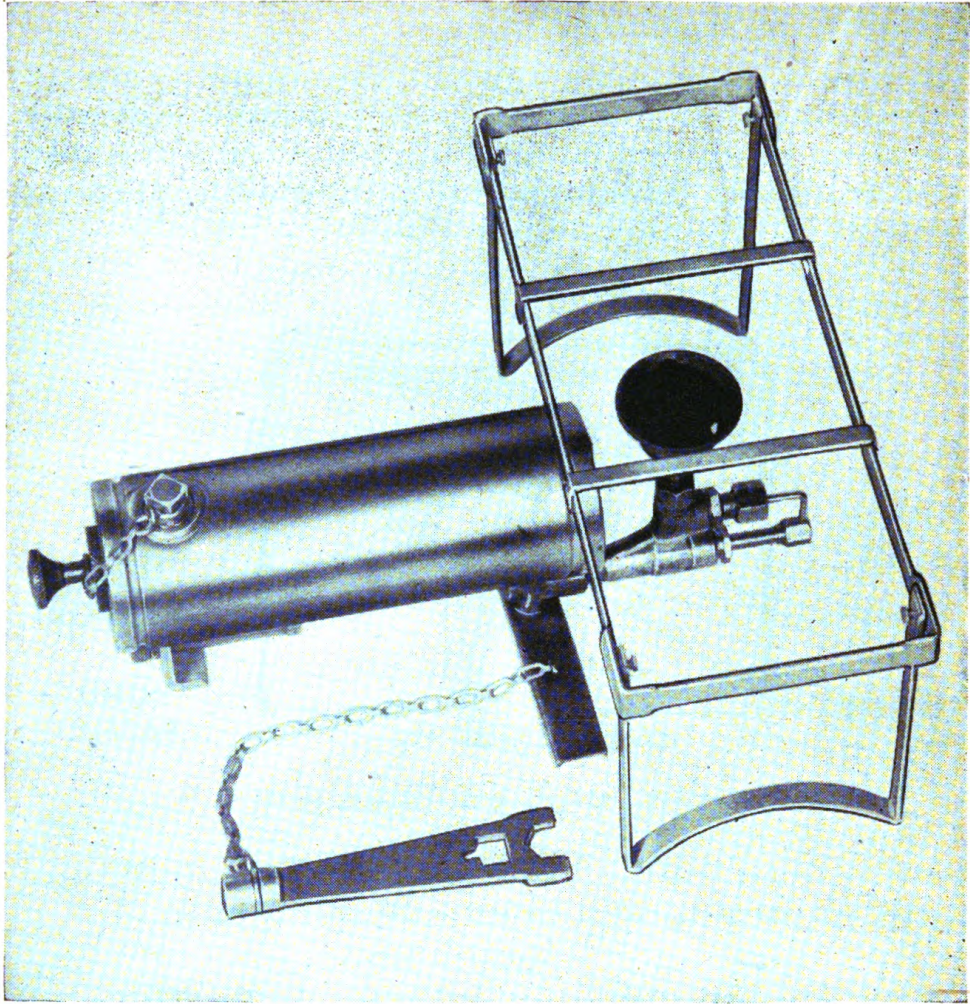


Figure 15. Item No. 9R10350—Stove assembly, gasoline.

Figure 16. Cross section of burner, one 2,500 B.T.U. head—Item No. 9R10005.

Med. Dept.		Med. Dept.	
No.	Nomenclature	No.	Nomenclature
1. 9R10318	VALVE, FUEL CONTROL, BURNER 2,500 B.T.U. HEAD:	9.	Fuel tank.
2. 9R10322	PACKING, VALVE, STEM, BURNER 2,500 B.T.U. HEAD:	10.	Check valve.
3. 9R10320	STEM, VALVE, BURNER 2,500 B.T.U. HEAD:	11. 9R10308	PUMP LEATHER, BURNER 2,500 B.T.U. HEAD:
4. 9R10326	STEM, ECCENTRIC, BURNER 2,500 B.T.U. HEAD:	12. 9R10310	AIR STEM, BURNER 2,500 B.T.U. HEAD:
5. 9R10328	BLOCK, ECCENTRIC, BURNER 2,500 B.T.U. HEAD:	13. 9R10306	PLUNGER, PUMP, BURNER 2,500 B.T.U. HEAD:
6. 9R10336	NUT, VAPORIZER, BURNER 2,500 B.T.U. HEAD:	14. 9R10302	PLUG, FILLER, BURNER 2,500 B.T.U. HEAD:
7. 9R10330	VAPORIZER, BURNER 2,500 B.T.U. HEAD:	15. 9R10304	GASKET, FILLER PLUG, BURNER 2,500 B.T.U. HEAD:
8. 9R10342	HEAD, BURNER 2,500 B.T.U. HEAD:	16.	Spare vaporizer container.
		17. 9R10338	HOUSING, INSTANT LIGHT, BURNER 2,500 B.T.U. HEAD:
		18.	Instant light body valve.

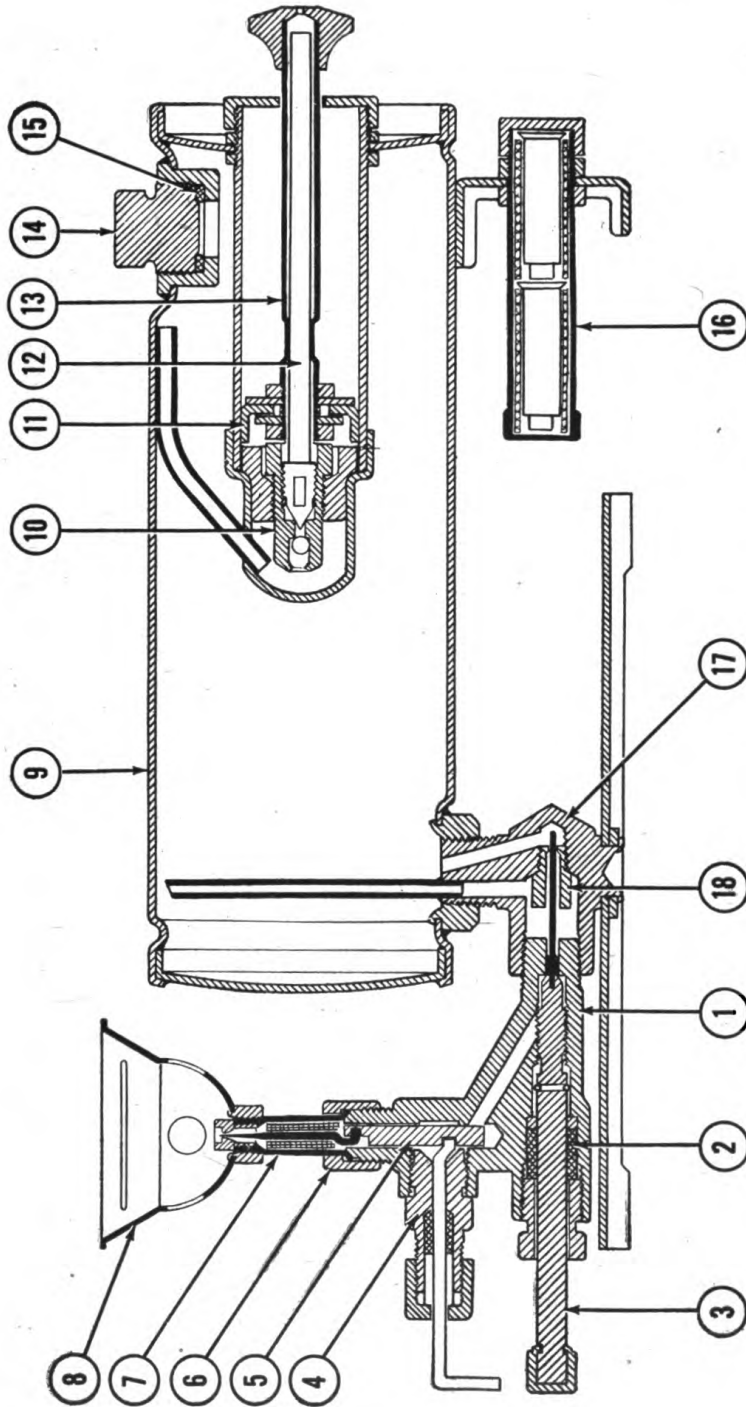


Figure 16. Cross section of burner, one 2,500 B.T.U. head—Item No. 9R10005.

and in controlling the movement of the gasoline to the burner head is identical with that of the other stoves and burners. The mechanical arrangement of this burner differs, however, from that of the others, principally because it is a horizontal unit whereas, the others are vertical units.

14. Types of Fuel That Can Be Used

The stoves and burners will operate with best results if the fuel used is a clean unleaded gasoline. However, if such gasoline is not available, the stoves and burners will perform satisfactorily with other types of gasoline, ranging from aviation gasoline to regular motor gasoline, even though such gasolines are leaded. If the use of a fuel other than a clean unleaded gasoline is necessary, the vaporizer of the burner will require more frequent servicing than when a clean unleaded gasoline is used. Any fuel used, regardless of its type, should be clean.

15. To Fill Fuel Tank

a. The operator should be familiar with the precautions in handling gasoline. (See AR 850-20.)

b. Before filling the fuel tank of a stove or burner see that the fuel control valve is closed and that the stove or burner is placed in a level position.

c. Unscrew and remove the filler tube plug, which is removed by hand. A wrench should not be used to tighten or loosen this plug.

d. Fill the fuel tank by pouring fuel into the open filler tube. (See fig. 10 (34).) The fuel will begin to rise in the tube as soon as the tank has been filled to the proper level. The filler tube extends into the tank and prevents overfilling. When the liquid fuel reaches the bottom of the tube, air in the tank cannot escape and, consequently, the fuel begins to rise in the tube, indicating that the fuel tank is filled to the proper level. This feature of the stoves and burners assures adequate space for the air needed to generate the instant light mixture required to light them.

e. When the tank is filled, replace and firmly tighten (by hand) the filler tube plug. Before replacing the plug, examine it carefully and remove any foreign matter that may be adhering to it.

16. To Pump Air Pressure

a. Air pressure necessary for operation of the stove or burner is provided by means of a pump (figs. 7 and 10), which extends out from the fuel tank. To operate the pump, proceed as follows:

b. Unlock the handle of the pump by turning the handle two full turns to the left (counterclockwise).

c. Hold thumb or palm of hand over vent hole in the end of pump handle and pump air into the tank until the air pressure gauge (fig. 10

(21)) registers 30 pounds pressure. In the instance of those stoves and burners not equipped with an air-pressure gauge, except burner 9R10005, 25 to 30 full strokes of the pump will provide the proper air pressure. Burner 9R10005 needs only 15 to 20 strokes. When proper air pressure has been obtained, lock the pump handle by turning it to the right (clockwise) as far as possible.

17. To Light Stove or Burner

a. Clean the gas tip of the vaporizer (figs. 10 (10) and 13) by revolving the eccentric stem handle (figs. 10 (16) and 13) several times. The handle must be in the down position when the stove or burner is lighted.

b. Open the fuel control valve (figs. 10 and 11) a quarter turn to the left (counterclockwise). After a few seconds, apply a lighted match at the top of the burner head. (See fig. 10 (12).)

c. Five or six minutes are required after the burner has been lighted for the vaporizer (figs. 10 and 13) to become sufficiently heated to cause complete generation of the fuel. The flame may flash yellow occasionally during this period or even blow itself out. If the latter occurs, relight the burner and as the vaporizer becomes heated the flame will gradually settle down to a steady blue color. During the first 2 or 3 minutes of operation maintain the air pressure at approximately 25 pounds by a few additional strokes of the pump. The pressure should then be allowed to drop to between 15 and 20 pounds, which is normal operating pressure for the larger burners. A few strokes of the pump on burner 9R10005 will also be sufficient. Proper air pressure can be maintained for models not equipped with pressure gauges through observation of the appearance and character of the flame. (As pressure becomes too low, the flame will tend to die down and to assume a yellow rather than a blue color.) It may be necessary to operate a stove or burner several times to determine accurately the number of strokes of the pump required to maintain proper air pressure.

d. When complete generation of the fuel has been obtained, open the fuel control valve as far as possible. The flame will be noticeably larger immediately after opening the valve wide than it will be 10 or 15 minutes later. This is a normal flame change, due to the gradual warming-up of the metal below the vaporizer, and is not an indication of a diminished output of heat.

e. If the stove or burner is equipped with more than one burner head, each burner head should be operated according to the foregoing instructions. However, it is not necessary to permit each burner head to develop complete generation before lighting the next. As soon as the first burner head is lighted, the remaining burner heads may also be placed in operation.

18. Adjustment of Flame

The size of the flame cannot be controlled by the fuel control valve. If the flame is too high, it may be adjusted by turning the eccentric stem handle up slightly; this procedure will move the cleaner needle into the gas tip, reducing the flow of gas to the burner head. A higher flame can be obtained by increasing the air pressure through a few strokes of the pump.

19. To Extinguish Stove or Burner

To extinguish a stove or burner, turn the fuel control valve to the right (clockwise) as far as possible.

PART THREE

MAINTENANCE INSTRUCTIONS

Section IX. GENERAL

20. Scope

Part Three contains information for first and second echelon maintenance. It contains information needed for service, as well as description of the major units and their function in relation to other components of the equipment.

Section X. LUBRICATION

21. Monthly

Place a few drops of Oil, castor: Technical grade (Castor) in the barrel of the air pump to keep the leather on the plunger soft. (See par. 38.)

Section XI. PREVENTIVE MAINTENANCE SERVICES

22. Operator Maintenance (First Echelon)

a. BEFORE OPERATION. (1) Be certain the unit is clean and free of carbon and gum.

(2) Be certain the burner head is firmly tightened on the vaporizer tube.

(3) Be certain the vaporizer screen is clean.

b. DURING OPERATION. Be certain there are no gasoline leaks.

c. AFTER OPERATION. (1) Be certain the unit is cleaned of all carbon and gum.

(2) Be certain the vaporizer screen is cleaned.

23. Organizational Maintenance (Second Echelon) (Weekly)

a. Clean vaporizers on burners or if necessary replace.

b. Clean carbon or gum from vaporizer filter screen.

c. Check for bent needle rod, replace if bent.

d. Check for leaks and repair them.

e. Check for proper operation of the burners.

f. Check spare parts to see that a sufficient number are kept with the unit and in good condition.

Section XII. TROUBLE SHOOTING

24. Burner Fails to Light

Possible causes

Insufficient air pressure.

Vaporizer clogged.

Gas orifice clogged.

Fuel tank empty.

Clogged filler screen.

Accumulation of water in fuel tank.

Possible remedies

Pump air pressure 25 to 30 full strokes or 30 pounds on pressure gauge. (See par. 16.)

Clean or replace vaporizer. (See par. 32.)

Rotate the eccentric stem handle to clean.

Fill tank.

Remove any loose dirt and carbon from fuel tank and clean screen.

Clean fuel tank. (See par. 39.)

25. Yellow Flame

Possible causes

Carbon or gum bridging across gas tip.

Carbon on lower surface of burner plate.

Dirt or carbon clogging the vaporizer filler screen.

Burner head not firmly tightened on vaporizer tube.

Tank pressure too low.

Possible remedies

Clean. (See par. 33.)

Clean. (See par. 35b.)

Clean. (See par. 32b.)

Tighten.

Pump several additional strokes.

26. Pump Does Not Operate Properly

Possible causes

Vent hole in pump not closed.

Pump leather dried out.

Ball check stuck.

Possible remedies

Hold thumb or palm of hand over vent hole in end of pump plunger.

Lubricate or replace pump leather. (See par. 38.)

Clean or replace ball check. (See par. 38c.)

27. Leak Around Filler Plug

Possible causes

Filler plug gasket damaged or worn out.

Filler plug damaged.

Possible remedies

Replace.

Replace.

28. Leak at Pack Nut on Tip Cleaner Assembly

<i>Possible causes</i>	<i>Possible remedies</i>
Loose pack nut.	Tighten. (See par. 36b.)
No packing.	Replace packing.

29. Tip Cleaning Lever Will Not Turn

<i>Possible causes</i>	<i>Possible remedies</i>
Frozen due to an accumulation of carbon.	Clean or replace needle rod. (See par. 33.)

30. Needle Rod Does Not Work

<i>Possible causes</i>	<i>Possible remedies</i>
Needle rod broken off.	Replace. (See par. 34.)
Needle loose in eccentric block.	Tighten.

31. Burner Backfires or Burns With Red Flashes

<i>Possible causes</i>	<i>Possible remedies</i>
Burner loose on vaporizer.	Tighten.
Burner plate corroded.	Clean.

Section XIII. MAINTENANCE OPERATIONS

32. Vaporizer

If a stove or burner will not light, the vaporizer may be clogged. The vaporizer may be replaced as an assembly, or the filler screen may be cleaned or replaced as a separate part.

a. TO REPLACE VAPORIZER (figs. 10, 13, and 16). (1) Remove the burner head assembled as follows:

(a) Loosen the two screws and take off the wind baffle.

Note. Some burners have the wind baffle and plate fastened to the burner head.

(b) Unscrew the burner head counterclockwise and remove it.

(2) Remove the jamb nut by turning counterclockwise.

(3) Lift off the vaporizer tube, filler coil and filler screen.

Note. If the needle rod is bent or broken, it may be replaced. Tighten the rod gently being careful not to damage the needle itself.

(4) If the gas orifice of the vaporizer tube has become enlarged or the tube damaged, it may be replaced. If, however, the vaporizer tube is in good condition, it is only necessary to replace the filler screen or filler coil and to place the old vaporizer tube over the filler coil being careful not to damage the needle rod.

(5) Replace and firmly tighten the jamb nut.

(6) Replace and firmly tighten the burner head assembly.

b. TO CLEAN VAPORIZER FILLER SCREEN (figs. 10(8), and 13). If a new vaporizer is not available, additional service may be obtained from the

stove or burner by cleaning the vaporizer filler screen, employing the following procedure:

- (1) Remove the burner head and jamb nut.
- (2) Remove the vaporizer, filler coil and screen from the needle rod.
- (3) Push the filler screen out of the filler coil with a match, pencil or similar object.
- (4) Unroll and wash the screen in Solvent, dry cleaning, being careful not to damage or alter the size of the mesh.
- (5) Reroll the screen tightly on a rod which should be the same size as or slightly smaller than the needle rod, and insert rolled screen and rod in the filler coil.
- (6) Withdraw the rod on which screen is rolled.
- (7) Reassemble and replace the vaporizer.
- (8) Replace the jamb nut and burner head.

33. Gas Orifice

To remove any carbon or gum deposit that may accumulate on the gas tip orifice (fig. 13) of the vaporizer tube, rotate the eccentric stem handle frequently while the stove or burner is in operation. The eccentric stem handle may be rotated while the burner or stove is in operation because the size of the gas tip orifice is larger than the diameter of the needle itself; the flow of fuel is, therefore, not completely shut off when the eccentric stem handle is rotated.

Note. Do not attempt to clean out any carbon or gum deposits in a way which would enlarge the gas tip orifice since this would permit more fuel to enter the burner head than is required for efficient and satisfactory operation. If the gas tip orifice has become enlarged or contains a carbon or gum deposit that cannot be removed by means of the eccentric stem, the vaporizer tube may be replaced.

34. Needle Rod

Do not attempt to straighten a damaged needle rod. (See figs. 10(7) and 13.) It should always be replaced with a new rod. A damaged needle rod may enlarge the orifice of the gas tip, permitting more fuel to enter the burner head than is required for efficient and satisfactory operation. Replace the needle rod as follows:

- a. Remove the burner head assembly.
- b. Remove the jamb nut.
- c. Lift off the vaporizer tube, filler coil, and filler screen.
- d. Unscrew the needle rod from the eccentric block.
- e. Screw a new needle rod into the eccentric block and tighten rod and lock nut gently, being careful not to damage the needle itself.
- f. Replace the filler screw, filler coil, and vaporizer tube.
- g. Replace the jamb nut and the burner head assembly.

35. Burner Head

- a. The burner head (figs. 10, 14, and 16), or heads of a stove or

burner must be inspected frequently to be sure the head has been firmly tightened on the vaporizer. If a head is not tight, the flame will flash yellow and a tendency to lose generation will result.

b. The plate of the burner head must be cleaned every few days if a fuel with a small lead content is used and daily when a fuel having a heavy lead content or dye is used. Clean the plate as follows:

(1) Loosen the two screws that join the burner plate and wind baffle, and lift the plate and baffle off the burner head. Hold the burner plate down while the screws are being loosened to avoid binding and damage to the threads of the screws.

(2) Scrape off the deposit of powdery crystals from the bottom of the burner plate with a stick or similar object. If this deposit is not cleaned off occasionally, it will cause backfiring and result in inefficient operation of the stove or burner.

(3) Replace the wind baffle and plate on the burner head and tighten the screws.

36. Fuel Leaks

If fuel leaks develop, close the fuel control valve immediately to extinguish the stove or burner and tighten the connections as soon as, but not until, the stove or burner is extinguished.

a. LEAK AROUND VALVE STEM PACK NUT. (1) Tighten pack nut (fig. 10 (18)) a few turns to hold packing in firm contact with valve stem.

Note. If the pack nut is drawn up too tight, the valve will not turn. Back off slightly.

(2) If the leak does not stop by tightening the pack nut, replace the packing, being certain the beveled side of the washer is toward the point of the valve stem and away from the control knob. The small washer is near the tip of the valve stem and the larger bushing is near the control knob on the valve stem.

b. LEAK AROUND ECCENTRIC STEM PACK NUT. (1) Tighten pack nut (fig. 19 (14)) a few turns to hold packing in firm contact with the eccentric stem.

Note. If pack nut is drawn up too tight, the lever will not turn. Back off slightly.

(2) If the leak does not stop by tightening the pack nut, replace the packing being certain the washer is away from the lever end on the stem.

37. Filler Plug

If air leaks from the tank and the pressure cannot be maintained, the filler plug gasket may be cracked or deeply grooved. Replace the gasket as follows:

a. Tighten the plug cap on the filler tube of the gasoline tank so as to hold the plug disk firmly while loosening the screw in the top of the plug.

b. Remove the disk and gasket by slipping the point of a knife under the gasket and lifting it out of the groove.

- c. Replace the old gasket with a new gasket, pressing the new gasket into place with the fingers.
- d. Replace the screw and tighten.

38. Air Pump

a. The leather (fig. 10 (31)) on the plunger of the air pump must be kept soft. The following procedure may be followed:

- (1) Unscrew the cap (fig. 10 (23)) on the air pump plunger.
- (2) Place a few drops of Oil, castor: technical grade (Castor) in the barrel of the pump.

(3) Replace the cap on the air pump plunger.

b. To REPLACE LEATHER PLUNGER. (1) Unscrew the cap on the pump plunger.

- (2) Withdraw the plunger from the pump tube.
- (3) Remove the square nut from the end of the plunger.
- (4) Replace leather plunger.
- (5) Replace square nut.
- (6) Place the plunger back into the pump tube being certain the leather is not cut while the plunger is inserted into the pump barrel.
- (7) Place a few drop of Oil, castor: technical grade (Castor) into the barrel of the tube.

(8) Replace cap on the pump plunger.

c. If the check valve (fig. 10 (33)) (small metal ball) in the air pump sticks, proceed as follows:

- (1) Remove the pump plunger.
- (2) Remove the air stem by unscrewing counterclockwise.
- (3) Insert a screw driver (some models require a 9-inch blade screw driver) and unscrew the check valve.
- (4) Wash the check valve thoroughly in Solvent, dry cleaning.
- (5) Replace the check valve to its normal position in the pump barrel.
- (6) Replace the air stem and plunger and tighten cap.

39. Dirty Fuel Tank

If the life of the vaporizer filler screen is relatively short, the fuel tank probably contains loose carbon or dirt. To remedy this difficulty, proceed as follows:

a. Remove the gasoline from the fuel tank by removing the pressure gauge and then pouring out the fuel through the gauge outlet. If the stove or burner is not equipped with a pressure gauge, remove the burner head and the fuel control valve assembly, and then pour the contents of the tank through the valve opening.

b. Clean the inside of the fuel tank by rinsing it with clean gasoline.

c. Refill the tank with clean fuel.

APPENDIX

Section I. SHIPMENT AND STORAGE

I. Draining Fuel Tank

When preparing a stove or burner for shipment or storage, the fuel should always be drained from the fuel tank.

a. STOVES AND BURNERS HAVING AN AIR PRESSURE GAUGE. (1) Remove the air pressure gauge.

(2) Pour the contents of the fuel tank through the gauge outlet.

(3) Replace the gauge.

b. STOVES AND BURNERS WITHOUT AN AIR PRESSURE GAUGE. (1) Remove the burner head and fuel control valve assembly.

(2) Pour the contents of the fuel tank through the valve opening.

(3) Replace the burner head and fuel control valve assembly.

2. Packing and Crating

The units are packed completely assembled. They may be crated in a wooden crate with paper or similar packing materials to prevent damage in shipment.

Caution: Drain the fuel tank. (See par. 1, app.)

Section II. SPARE PARTS KITS

3. Spare Parts Kits

a. Medical Department kit No. 9R10280, Medical Department Item No. 9955000, manufacturer's No. 521.

Med. Dept. No.	Description	Quantity
9R10080	Filler tube plug gasket	2
9R10110	Vaporizer needle rod	1
9R10138	Valve stem packing	1
9R10150	Filler tube plug	1
9R10164	Pump plunger leather	1
9R10182	Vaporizer filler screen	1
9R10256	Vaporizer assembly	2
.....	Wrench	1

b. Medical Department kit No. 9R10285, Medical Department Item No. 9955500, manufacturer's No. 523.

Med. Dept. No.	Description	Quantity
9R10044	Filler tube plug cap	1
9R10086	Filler tube plug gasket	2
9R10110	Vaporizer needle rod	2
9R10138	Valve stem packing	1
9R10164	Pump plunger leather	1
9R10182	Vaporizer filler screen	2
9R10256	Vaporizer assembly	4
.....	Wrench	1

c. Medical Department kit No. 9R10290, Medical Department Item No. 9R10000, manufacturer's No. 526.

Med. Dept. No.	Description	Quantity
9R10080	Filler tube plug gasket	1
9R10110	Vaporizer needle rod	1
9R10138	Valve stem packing	1
9R10150	Filler tube plug	1
9R10164	Pump plunger leather	1
9R10182	Vaporizer filler screen	1
9R10256	Vaporizer assembly	2
.....	Wrench	1

d. Medical Department kit No. 9R10291, Medical Department Item No. 9R10001, manufacturer's No. 522.

Med. Dept. No.	Description	Quantity
9R10056	Vaporizer filler coil	2
9R10084	Filler tube plug gasket	2
9R10112	Vaporizer needle rod	1
9R10136	Valve stem packing	1
9R10140	Eccentric stem packing	1
9R10148	Filler tube plug	1
9R10164	Pump plunger leather	1
9R10184	Vaporizer filler screen	2
9R10200	Valve stem assembly	1
9R10254	Vaporizer assembly	2
.....	Wrench	1

e. Medical Department kit No. 9R10292, Medical Department Item No. 9R10002, manufacturer's No. 525.

Med. Dept. No.	Description	Quantity
9R10056	Vaporizer filler coil	4
9R10082	Filler tube plug gasket	1
9R10112	Vaporizer needle rod	2
9R10136	Valve stem packing	1
9R10140	Eccentric stem packing	1
9R10152	Filler tube plug	1
9R10164	Pump plunger leather	1
9R10184	Vaporizer filler screen	4
9R10200	Valve stem assembly	1
9R10254	Vaporizer assembly	4
.....	Wrench	1

f. Medical Department kit No. 9R10293, Medical Department Item No. 9R10003, manufacturer's No. 524-497.

Med. Dept. No.	Description	Quantity
9R10056	Vaporizer filler coil	4
9R10082	Filler tube plug gasket	1
9R10112	Vaporizer needle rod	4
9R10136	Valve stem packing	1
9R10140	Eccentric stem packing	1
9R10152	Filler tube plug	1
9R10164	Pump leather	2
9R10184	Vaporizer filler screen	4
9R10200	Valve stem assembly	2
9R10254	Vaporizer assembly	4
.....	Wrench	1

g. Medical Department kit No. 9R10294, Medical Department Item No. 9R10004, manufacturer's No. 522-375S and Item No. 9R10006, manufacturer's No. 522-375S-3.

Med. Dept. No.	Description	Quantity
9R10056	Vaporizer filler coil	4
9R10082	Filler tube plug gasket	2
9R10112	Vaporizer needle rod	4
9R10154	Filler tube plug	1
9R10166	Pump plunger leather	2
9R10184	Vaporizer filler screen	4
9R10200	Valve stem assembly	1
9R10254	Vaporizer assembly	4
.....	Wrench	1

h. Medical Department kit No. 9R10295, Medical Department No. 9R10005, manufacturer's No. 527.

Med. Dept. No.	Description	Quantity
9R10330	Vaporizer assembly	3
9R10304	Filler plug gasket	1
9R10322	Valve stem packing	1
9R10308	Pump leather	1

Section III. REFERENCES

4. Army Regulation

Precautions in handling gasoline..... AR 850-20

5. Army Service Forces Medical Supply Catalog

List of items for troop issue..... Med 3

Organizational and higher echelon spare parts..... Med 7

List of all service parts..... Med 9

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